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"WINDSHIELD TIME" OR "WRENCH TIME:" SOME PROPOSALS FOR IMPROVING WORCESTER'S FLEET MANAGEMENT

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EXECUTIVE SUMMARY

Based on a survey of fleet management in comparably sized cities, a review of fleet management literature, and assistance from directors of fleet management for two major companies, the Research Bureau makes the following suggestions for improving Worcester's fleet management:

- Centralize the administration of the entire fleet. This is more important than physical consolidation of garages because it establishes clear responsibility and encourages efficient purchasing.
- Install a common software system throughout all fleet facilities that enables the fleet administrator to plan work, track parts and labor, keep an inventory of vehicles and each vehicle's repair and maintenance history.
- Establish work shifts to accommodate the operating characteristics of the fleet. Public works vehicles are generally available for maintenance after 3 p.m. Yet the shifts are arranged so that 80% of the mechanics work days rather than nights when most of the maintenance could be done without removing trucks from their regular assignments.
- Analyze the size of the fleet to determine if it is appropriate for all the tasks to be performed, and sell underutilized vehicles.
- Establish an appropriate lifecycle for all vehicles based on maintenance costs. This will lead to major administrative and financial improvements such as increased vehicle availability, greater reimbursable warranty work, and higher salvage value.
- Establish a vehicle replacement fund to accommodate the lifecycles selected. Fleet Services in Portland, Oregon charges a rental fee to each department for each vehicle that covers both maintenance and replacement costs. Incurring these costs provides departments with the incentive to better maintain vehicles so that salvage returns are higher and replacement costs are lower.
- Improve the preventive maintenance (P.M.) program in order to minimize the need for major repairs and increase the return on salvage.
- Consider privatizing fleet services because of time and effort required to centralize fleet administration, install and train staff on a single software system, and establish a replacement fund.

I. INTRODUCTION

At the request of the Worcester City Council, the Research Bureau undertook a study to determine the feasibility of consolidating the City's garages. These consist of DPW's Central Garage on Albany Street, two satellite garages for the Water and Sewer Departments, two satellite storage areas operated by the Parks Department, the Police Department garage and the Fire Department maintenance facility. For technical information of fleet operations, the Research Bureau enlisted the assistance of the Directors of Fleet Services at New England Electric Systems and AMI Leasing. In addition, we reviewed fleet management literature and surveyed five cities of comparable size to Worcester.[1] To accurately assess the cost effectiveness of consolidation would require knowing the costs of repairing comparable vehicles at the various garages. Unfortunately, those data are not currently available. However, it is possible to specify what are widely recognized as the

[1] The cities surveyed were Dayton, OH; DesMoines, IA; Chattanooga, TN; Ft. Lauderdale, FL; Springfield, MA.

foundations of a good fleet management system:[2]

1. Centralized delivery of fleet services. This means that one agency or division of an agency is responsible for the administration of the entire fleet, even when the fleet itself may be garaged in separate facilities. This arrangement establishes clear responsibility for the City's fleet and allows the administration to set citywide policy and objectives, encourage efficiency, institute a preventive maintenance program, and take advantage of volume purchases of vehicles, parts, and supplies. In many cities, centralization is accomplished through a separate department of fleet services.

2. A management information system that uses current technology. Such a system will contain scheduling information about vehicles and maintenance needs, and can provide performance information on items such as downtime and repeat work.

3. Financial policies that clearly identify costs and charge fair rates to customers for services rendered. The full costs of fleet operations should be recovered from users. An internal service fund is the preferred accounting structure.

4. A stable replacement fund that provides long term funding for fleet needs.

II. OVERVIEW OF WORCESTER'S FLEET

A. Department of Public Works (DPW)

DPW's Central Garage, located on Albany Street, is responsible for maintaining a diverse fleet of 605 pieces of equipment (including riding lawnmowers, sedans, pick-up trucks, front-end loaders, and road graders). Of these, 464 are assigned to DPW, while the remaining 141 pieces are assigned to other municipal departments (including Parks and Recreation, Public Health and Code Inspection, Hope Cemetery, and OPCD). The garage has 12 repair bays. Two smaller facilities near the Central Garage are staffed by mechanics from DPW's Water and Sewer Divisions; they are responsible for maintaining vehicles assigned to those divisions. In addition, the Parks Department has two satellite facilities located at Hope Cemetery and Green Hill Park, both of which are used primarily for storage.

DPW has a total of 16 mechanics, 11 at the Central Garage, and 3 at the Water Garage and 2 at the Sewer Garage. There are two shifts at the Central Garage; 13 of the 16 mechanics work the day shift. Although the total number of authorized positions for the Central Garage is 44, only 21 are funded as a result of budget cuts dating back to the early 1990's.

The tax levy budget for the Central Garage in FY00 is $1.06 million. Total personnel costs are about $746,000. After personnel charged to the water and sewer enterprise accounts are subtracted, tax levy expenditures are about $581,000. Ordinary maintenance costs (including parts, supplies and fuel) are about $485,000 (after ordinary maintenance is credited to water and sewer divisions and other departments for repair of their vehicles). The Central Garage does not recover the full cost of the services it provides to the various departments. While the recovery cost for services is greater from the Water and Sewer divisions, both of which are operated on enterprise accounts, it should be noted that the hourly rate calculated for mechanics has remained the same for a decade.

While the Central Garage performs some repairs and preventive maintenance, it also outsources a considerable number of jobs including transmissions, brake drums, radiators,

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[2] See, for example, Office of the City Auditor, Portland, Oregon, "Consolidation of Fire Apparatus Maintenance with the Fleet Services Division: An Analysis of Potential Savings," March, 1999, pp. 6-7.

hydraulic components and catch basin machines. The Central Garage evaluates the list of jobs each year to determine which repairs and maintenance should be outsourced for purposes of efficiency and economy.

B. Police Department

The Police Department garage is located at the Department headquarters at Lincoln Square. The garage personnel are responsible for maintaining 195 motor vehicles plus several motorcycles, boats, and confiscated vehicles for a current total of 207 vehicles. It is staffed by three mechanics and one foreman, all of whom are civilians. A sergeant from the Department oversees the entire operation. There is one shift only from 7 a.m - 3 p.m., Monday through Friday; any service required on the weekends is done by private vendors. The garage has 5 bays. The FY00 tax levy budget for the Police Department garage is $261,853 for a total of 7 positions. The budget for vehicle maintenance and repair, vehicle parts and supplies, and gasoline is $384,550.

C. Fire Department

The Maintenance Division of the Worcester Fire Department, located on Grove Street, is responsible for maintaining 61 vehicles, radios and other pieces of specialized equipment. It is also responsible for providing 12 fire stations with household and medical supplies which, according to the fleet consultants, should be separate from fleet maintenance operations. The Division has one supervisor, one working foreman, two fire apparatus repairmen, one radio repairman, and one custodian. Mechanics have received specialized training to repair fire equipment. The Division has one day shift although employees are on call nights and weekends in the event of emergencies. The FY00 tax budget for this division is $259,401 for 6 positions and $525,000 for parts and other supplies.

III. OVERVIEW OF FLEET ADMINISTRATION ISSUES

A number of administrative issues must be addressed before assessing the feasibility or desirability of garage consolidation.

A. Fleet Information System

Each of Worcester's garages has a separate information system. Only the Central Garage has a stand-alone system which was installed following the recommendations of the Business Task Force for More Effective Government report in 1992. The Central Garage fleet information system provides work orders, a PM schedule, inventory control, and an accounting system for charging other departments for work performed. It can be connected to the other garages. The Police Department has an information system that is integrated into departmental operations.

Four of the five fleet managers interviewed in other cities had one system that integrated all vehicles regardless of whether garage operations were consolidated. In fact, three of the five cities had separate departments of Fleet Services responsible for the administration of all city-owned vehicles. An up-to-date information system is critical for providing accurate data to manage a fleet. Such data includes cost per mile, average mileage, average age of fleet, lifecycle costs, inventory, parts purchasing program, vehicle replacement and P.M. The information system would be able to indicate how many vehicles will need P.M. in the following weeks so that plans can be made accordingly. In order for such a program to be most effective, 3-4 years of data are necessary. If that is unavailable, modeling from similar fleets can provide a good starting point. Without an information system that provides the kind of data mentioned above, there is no way of knowing how operations can be made more effective and efficient. According to the fleet administrators interviewed, the cost of

In addition to the fixed charges, Portland's Fleet Services Division charges a direct hourly rate for work not covered by the fixed annual charge. These charges cover non-routine repair work that results from unusual wear and tear that would not be expected from normal use of the vehicle. This added charge provides an additional incentive to keep vehicles well-maintained. Direct labor charges also apply to all body, paint, and fabrication work. About 80 percent of the division's revenue is derived from fixed-rate charges and 20 percent from direct charges. Both the fixed rate charges and the direct billing capture indirect costs associated with maintenance services, such as shop and Bureau of General Services administrative overhead. General Fund overhead of 3.75 percent is not captured in the rates but is added to bills as they are invoiced.

Over the past several years the fixed rates in Portland for the most commonly used vehicles such as patrol cars, sedans, and pickup trucks, have decreased significantly for both maintenance and replacement. Labor rates have also stayed even or declined. Table A shows examples of fixed and labor rates for the past seven years.

TABLE A FIXED AND LABOR RATE TRENDS (ADJUSTED FOR INFLATION)

	FY 91-92	FY 92-93	FY93-94	FY94-95	FY95-96	FY96-97	% CHG. 91-97	CURRENT RATES
General Purpose Sedan								
Operating costs	$ 1,264	1,140	827	825	846	837	-34%	870
Replacement	1,645	1,649	1,614	1,521	1,635	1,672	2%	1,525
Police Patrol Sedan								
Operating costs	4,648	4,900	4,183	3,901	3,937	3,480	-25%	3,378
Replacement	5,427	5,580	5,001	5,007	5,742	5,201	-4%	4,251
Standard 3/4 ton Pickup								
Operating costs	1,689	1,743	1,489	1,720	1,456	1,567	-7%	1,363
Replacement	1,736	1,585	1,457	1,367	1,315	1,332	-23%	1,341
Hourly Labor Rates								
Mechanical	59	60	57	55	56	57	-4%	57
Body & Paint	64	65	63	63	62	63	-2%	64

Source: Bureau of General Services reports, Portland, Oregon

C. Preventive Maintenance

Preventive maintenance must be an integral part of fleet management. Without it, corrective maintenance costs escalate, scheduling and staffing are difficult to arrange, and costs become uncontrollable. Although the City's garages have PM programs, they are frequently not adhered to because of repairs that take precedence. Such repairs include (for example) those done to rubbish packer trucks that must be in service every day and salt/sand trucks that must be given priority during winter snow and ice storms. One way in which to address the problem of establishing a regular PM program is to change work schedules as explained in the section that follows.

D. Work Shifts

The appropriate time to repair and maintain vehicles is when the vehicles are not in use. Taking vehicles out of service for maintenance requires maintaining additional vehicles for the fleet. Work shifts should be established to accommodate the operating characteristics of the fleet. DPW vehicles are generally available for PM after 3 p.m. Yet the shifts are arranged so that 13 mechanics are working days, while only 3 are working on the night shift when most of the PM could be done.[4] The Police Department garage has no night shift. By contrast, New England Electric Systems has 30% of its mechanics working days and 70% working nights in order to service its 2,700 vehicles most efficiently. That kind of split is the generally accepted norm for fleet mechanics.

[4] There is no pay differential for working the night shift.

E. Staffing Patterns

The fleet managers who were interviewed identified some generally accepted guidelines for the number of units maintained per mechanic. For a fleet of light vehicles, such as sedans or light trucks, the general guideline is about 40-45 units per mechanic. For fleets with an average age above two years, the guideline is about 30-35 vehicles per mechanic. The staffing guidelines for heavy vehicles, fire equipment. and rubbish packers call for 11-13 vehicles per mechanic. In order to meet these guidelines, the DPW would have to add two mechanics for a total of 18.

F. Physical Consolidation of Garages

All the cities surveyed and those cited in our literature review maintain more than one garage to accommodate diverse types of vehicles. Fire equipment, for instance, requires vastly different maintenance skills than sedans. It is inefficient to employ mechanics with the specialized training to maintain fire equipment for maintaining sedans. Similarly, maintaining DPW's specialized equipment such as rubbish packers, requires different skills from maintaining police patrol cars. But the vehicles maintained at the Water and Sewer garages are similar enough to other DPW equipment that they could be combined with the Central Garage, which has room to accommodate those vehicles. A significant deterrent to centralizing the other facilities, however, is "windshield time," that is the time it takes to shuttle vehicles from garaged locations to maintenance locations. According to fleet managers, this "non-wrench" time could consume 50% of a mechanic's time.

IV. CONCLUSIONS AND RECOMMENDATIONS

A. Centralize administration of fleet services.

The Research Bureau's review of the fleet management literature and survey of the other cities indicates that it is critical to centralize the administration of fleet services. A common software system throughout all fleet facilities would enable the fleet administrator to plan work, track parts and labor, keep an inventory of vehicles and vehicle history. At present, the foreman at the Police Department garage schedules work and orders parts on paper rather than by computer.

The advantages of a common computer system cannot be overstated. This would enable the City Manager to establish a separate Department of Fleet Services or a consolidated division under the Department of Public Works headed by a single administrator who could combine all fleet purchasing including fuel, parts, and vehicles. The greater size of a consolidated fleet would allow the City to standardize vehicles and purchase vehicles and parts in greater quantities, thereby reducing costs. (See Appendix A for additional evidence of the benefits of a centralized management information system.)

B. Right-size the fleet.

Once a management information system is in place, an analysis of the fleet must be undertaken to determine if it is the right size. Those vehicles that are underutilized should be sold. Because most maintenance and repairs are currently performed during the day, the City has to have numerous "spare" vehicles to compensate for those out of service. If more work were done at night, many spare vehicles could be sold.

C. Establish an appropriate lifecycle for all vehicles.

According to fleet managers surveyed, establishing the appropriate lifecycle based on maintenance costs is the foundation for major administrative and financial improvements in a fleet. Parts and labor increase as equipment ages. The lifecycle should be determined after a good PM program is in place and costs of repairing vehicles are known. Since the City administration does not have its own data, it should initially develop a model based on collective averages of similar fleets. The results of an appropriate lifecycle (such as 36 months for sedans) include the following:

- Less maintenance, easier diagnostics, lower costs
- Increased vehicle availability
- Increased parts availability
- Reimbursable warranty work (which the City may not be taking advantage of now)[5]
- Proportionally higher salvage value of newer vehicles
- Improved vehicle appearance which may influence voter perception

D. Establish a vehicle replacement fund to accommodate lifecycles selected.

The previously described replacement fund established in Portland, Oregon, provides one example of how vehicles can be replaced on a regular basis. Charging a rental fee to each department for each vehicle that covers both maintenance and replacement provides departments with the incentive to better maintain vehicles so that salvage returns are higher and replacement costs are lower.

E. Establish a PM program and keep it on track.

Again, the importance of a PM program cannot be overstated. It will help to minimize the need for major repairs, and increase the return on salvage. Keeping a PM program on track requires that fleet services have an adequate number of mechanics, or else the work should be outsourced. For example, should fleet services perform regular oil changes or would it be less expensive to take vehicles to a garage that specializes in that service? Finally, a PM program and all vehicle work require that working hours be based on operating needs. Mechanics should be available to perform PM and other repairs when vehicles are not in use.

F. Consider privatizing fleet services.

Given the time and effort that will be required to centralize fleet administration, purchase, install and train staff to use a single software system, establish a PM program for all vehicles, and rearrange work schedules, the City administration should consider privatizing the maintenance of the fleet. Ft. Lauderdale, Florida privatized its fleet maintenance in 1981, resulting in the need for fewer personnel and lower costs for work performed. Ft. Lauderdale's fleet administrator maintains overall control by determining the size of the fleet and the vehicles to be purchased. The actual transactions are executed by the city's purchasing department .

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[5] For example, AMI does not pay for replacement of lights or batteries. These parts are included as part of the reimbursable warranty that comes as a result of consolidated purchasing power.

Appendix A

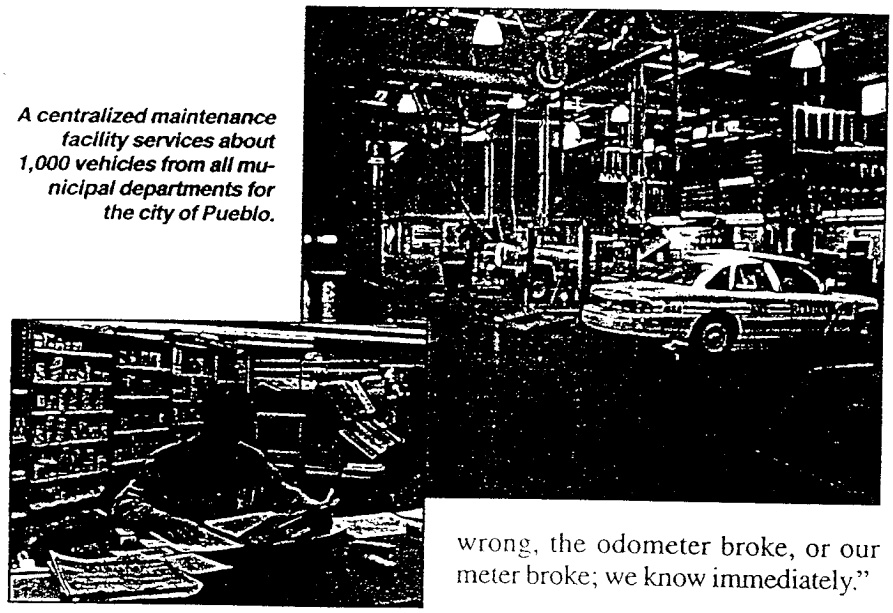
COMPUTERIZATION

City of Pueblo Shop Run More

The Pueblo, CO, fleet maintenance department has fully automated its shop, using computers to manage every aspect of maintenance. This has eliminated excess paperwork and reduced downtime for its mechanics.

By John Moore

Like most businesses, more and more maintenance facilities are becoming "paperless," using computers to manage all aspects of business. The city of Pueblo, CO, is ahead of the curve, having used computers in its maintenance facility for the past 15 years. The centralized facility services approximately 1,000 vehicles from all municipal departments for the city. By using computers to track mileage, schedule repairs, and track fuel and parts expenditures, the facility has been able to lower costs and increase its operating efficiency.



A centralized maintenance facility services about 1,000 vehicles from all municipal departments for the city of Pueblo.

The fleet management software used by the city of Pueblo also keeps track of all parts used in the repair facility, said Sam Ingo (above), parts manager for the city.

Gradual Switch to Paperless Shop

Rather than switching the system all at once to a computerized system, Fleet Manager Glenn Schoenrock made the transition gradually, starting with the fuel system. An automated fuel system was installed first. The automated fuel system was then merged with a fleet management system, which tracks vehicle mileages automatically. Drivers are required to enter correct mileages at every fueling. This data is sent to the main computer, which updates the mileage. Mileages are automatically tracked by the system and used to generate reports for scheduled preventive maintenance.

Prior to using the computerized system, the city had to send a mileage report out to the user's department. They would take the unit ID number, give the odometer reading, and send it back. Records were then updated and drivers of vehicles needing service were contacted. According to Schoenrock, "Ninety percent of the time, the reports were inaccurate. Someone would record the wrong odometer, etc. This way, with the fuel system, they must punch in the right odometer reading in. If it's wrong, it will kick it out as an exception. So we look at the odometer reading immediately to find out if it was punched in wrong, the odometer broke, or our meter broke; we know immediately."

Automated System Helps Enforce Scheduled Repairs

The automated system has allowed the Pueblo fleet maintenance department to track and enforce scheduled preventive maintenance, reducing unnecessary repairs.

"When I came to work for the city of Pueblo 16 years ago, they had no automation whatsoever," Schoenrock said. "Vehicles weren't being brought in on time for maintenance. What we do here is schedule all the vehicles to the user's department, and if they don't bring them in, we can shut their fuel off. So, they have to bring them in for service."

HELPS

Efficiently

Parts Management Simplified by Integrated System

In addition to fuel and maintenance management, the city also integrated its parts department, increasing the efficiency of its ordering and reporting. The system automatically prints usage reports to assist in ordering, and automatically deducts parts expenses from the user departments' accounts.

The system also is programmed to tell the parts manager what parts he's going to need for a specific job. The system lists all the parts numbers by vendor part number.

"Instead of looking them up in the catalog, he can go pull the parts off the shelf, thus saving downtime, with mechanics standing around not doing anything," Schoenrock said.

The automated system has greatly increased efficiency in parts management and ordering. "Our parts room was practically non-existent, until we became automated," Schoenrock said. "Now, we have control over the parts."

"It gives you better control over the inventory because you can track order points," added Parts Manager Sam Ingo.

Computerized Shop Reduces Paperwork, Saves Money

In addition to improving vehicle maintenance, the computerized system has also saved money by improving the shop's operating efficiency.

"There has been a tremendous savings in all areas of repair," said Schoenrock. "Before, city employees were driving vehicles until they would break down. We would go out and pick them up, but at the time, it cost too much money to fix them. We lost a lot of engines, transmissions, differentials, and brakes. The brakes were getting into the rotors and drums. Now we're catching it before we even get into the drums or rotors. I don't see how anyone today can run a fleet without being automated. If they're doing it that way, it's not being done right." AF

Switching to a paperless shop has allowed the city of Pueblo to track preventive maintenance more closely, eliminating repairs associated with improper repair timing, said Glenn Schoenrock, fleet manager.